

What is claimed is:

1. A refrigerant cycle system comprising:
 - a compressor for compressing refrigerant;
 - a first heat-exchanging portion for cooling and condensing gas refrigerant discharged from the compressor by radiating heat;
 - a gas-liquid separator for separating refrigerant into gas refrigerant and liquid refrigerant, into which all of refrigerant after passing through the first heat-exchanging portion and a part of gas refrigerant discharged from the compressor are introduced;
 - a second heat-exchanging portion disposed downstream of the first heat-exchanging portion, for cooling and condensing refrigerant flowing from the gas-liquid separator by radiating heat;
 - a gas-refrigerant return passage through which at least gas refrigerant in the gas-liquid separator is introduced into the second heat-exchanging portion;
 - a decompression device disposed downstream of the second heat-exchanging portion, for decompressing refrigerant after passing through the second heat-exchanging portion; and
 - an evaporator disposed downstream of the decompression device, for evaporating refrigerant flowing out of the decompression device.

2. The refrigerant cycle system according to claim 1, further comprising:

a refrigerant introduction passage through which all of the refrigerant discharged from the first heat-exchanging portion flows

into the gas-liquid separator; and

a gas refrigerant bypass passage through which gas refrigerant discharged from the compressor directly flows into the gas-liquid separator while bypassing the first heat-exchanging portion.

3. The refrigerant cycle system according to claim 1, further comprising a gas-liquid mixing portion in which all of refrigerant after passing through the first heat-exchanging portion and a part of gas refrigerant discharged from the compressor are introduced and mixed, wherein:

the gas-liquid separator has a refrigerant inlet from which refrigerant is introduced; and

the gas-liquid mixing portion is connected to the refrigerant inlet of the gas-liquid separator.

4. The refrigerant cycle system according to claim 3, wherein:

first and second heat-exchanging portions are integrated to form a heat exchanging section, a first header tank and a second header tank of a condenser;

the heat exchanging section includes a plurality of tubes through which refrigerant flows;

the first header tank and the second header tank are disposed at two sides of the heat exchanging section to communicate with the tubes; and

the gas-liquid mixing portion is provided in the first header tank.

5. The refrigerant cycle system according to claim 1, further comprising

a liquid-refrigerant return passage through which a part of liquid refrigerant in the gas-liquid separator is introduced into an upstream position of the decompression device.

6. The refrigerant cycle system according to claim 5, wherein the liquid-refrigerant return passage communicates with an inlet side of the second heat-exchanging portion.

7. The refrigerant cycle system according to claim 5, wherein the liquid-refrigerant return passage communicates with an outlet side of the second heat-exchanging portion.

8. The refrigerant cycle system according to claim 2, further comprising

a passage-area adjusting device disposed in the gas-refrigerant bypass passage, for adjusting a passage area of the gas-refrigerant bypass passage, wherein an amount of liquid refrigerant stored in the gas-liquid separator is controlled in accordance with a super-heating degree of gas refrigerant discharged from the compressor.

9. The refrigerant cycle system according to claim 8, further comprising

an inlet portion from which gas refrigerant discharged from the compressor is introduced into the first heat-exchanging

portion,

wherein the inlet portion is provided in the first heat-exchanging portion, and the gas-refrigerant bypass passage and the passage-area adjusting device are provided in the first heat-exchanging portion.

10. The refrigerant cycle system according to claim 8, further comprising an inlet portion from which gas refrigerant discharged from the compressor is introduced into the first heat-exchanging portion, wherein:

the inlet portion is provided in the gas-liquid separator, and the gas-refrigerant bypass passage and the passage-area adjusting device are provided in the gas-liquid separator.

11. The refrigerant cycle system according to claim 8, wherein the passage-area adjusting device includes a valve body disposed rotatably for adjusting the passage area of the gas-refrigerant bypass passage.

12. The refrigerant cycle system according to claim 1, further comprising:

an inlet portion through which gas refrigerant discharged from the compressor is introduced into the first heat-exchanging portion, the inlet portion being disposed outside the first heat-exchanging portion;

a gas-refrigerant condensing passage through which the gas refrigerant discharged from the compressor is introduced from the

inlet portion into the first heat-exchanging portion, the gas-refrigerant condensing passage being disposed outside the first heat-exchanging portion; and

a gas-refrigerant bypass passage through which the gas refrigerant discharged from the compressor is directly introduced into the gas-liquid separator while bypassing the first heat-exchanging portion, the gas-refrigerant bypass passage being disposed outside the first heat-exchanging portion.

13. The refrigerant cycle system according to claim 12, wherein:

the gas-liquid separator includes a tank body having a gas-liquid separating space for separating refrigerant into gas refrigerant and liquid refrigerant; and

the gas-refrigerant condensing passage and the gas-refrigerant bypass passage are provided in the tank body.

14. The refrigerant cycle system according to claim 12, wherein:

the inlet portion is formed to be separated from the gas-liquid separator, and is attached to the gas-liquid separator; and

the gas-refrigerant condensing passage and the gas-refrigerant bypass passage are provided in the inlet portion.

15. The refrigerant cycle system according to claim 12, wherein:

the gas-liquid separator has a liquid-refrigerant return

passage through which a part of liquid refrigerant in the gas-liquid separator flows;

the gas-refrigerant return passage is joined to the liquid-refrigerant return passage to form a mixing portion where gas refrigerant from the gas-refrigerant return passage and liquid refrigerant from the liquid-refrigerant return passage are mixed; and

the mixing portion is provided in the gas-liquid separator such that refrigerant in the mixing portion is introduced into the second heat-exchanging portion.

16. A refrigerant cycle system comprising:
 - a compressor for compressing refrigerant;
 - a first heat-exchanging portion for cooling and condensing gas refrigerant discharged from the compressor by radiating heat;
 - a gas-liquid separator for separating refrigerant into gas refrigerant and liquid refrigerant, into which all of refrigerant after passing through the first heat-exchanging portion is introduced;
 - a second heat-exchanging portion disposed downstream of the first heat-exchanging portion, for cooling and condensing refrigerant flowing from the gas-liquid separator by radiating heat;
 - a gas-refrigerant return passage through which gas refrigerant in the gas-liquid separator is introduced into the second heat-exchanging portion;
 - a decompression device disposed downstream of the second

heat-exchanging portion, for decompressing refrigerant after passing through the second heat-exchanging portion;

an evaporator disposed downstream of the decompression device, for evaporating refrigerant flowing out of the decompression device; and

a heating unit for adjusting a heating amount of the liquid refrigerant in the gas-liquid separator in accordance with any one of a super-heating degree of gas refrigerant discharged from the compressor and a super-heating degree of gas refrigerant at an outlet of the evaporator.

17. The refrigerant cycle system according to claim 16, further comprising

a liquid-refrigerant return passage through which a part of liquid refrigerant in the gas-liquid separator is introduced into an upstream position of the decompression device.

18. The refrigerant cycle system according to claim 17, wherein the liquid-refrigerant return passage communicates with an inlet side of the second heat-exchanging portion.

19. The refrigerant cycle system according to claim 17, wherein the liquid-refrigerant return passage communicates with an outlet side of the second heat-exchanging portion.